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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,054	12/22/2004	Mark Thomas Johnson	NL 020580	6801

24737            7590            04/30/2007  
PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
P.O. BOX 3001  
BRIARCLIFF MANOR, NY 10510

EXAMINER
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MANDEVILLE, JASON M

ART UNIT	PAPER NUMBER
2609	

MAIL DATE	DELIVERY MODE
04/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/519,054	JOHNSON, MARK THOMAS	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jason M. Mandeville	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 22 December 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 22 December 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>28 November 2005</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____ .

## **DETAILED ACTION**

### ***Drawings***

1. Figures 2 and 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification Objections***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **Electrophoretic Display Panel with Optical Gray State Control.**

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3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

**Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Claim Objections***

4. Claims 2, 3, and 5 objected to because of the following informalities: On line 1 of each of these claims, the words "as claimed in claimed" should be replaced with the words "as claimed in claim" for each instance. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-5 are rejected under 35 U.S.C. 102(e)** as being anticipated by Satoshi Inoue (hereinafter "Inoue"; US 6,842,165).

7. As pertaining to **Claim 1**, Inoue discloses an electrophoretic display panel (see Fig. 1; an "electrophoretic display device" is mentioned; however, the Inoue invention specifically describes the electrophoretic display panel (2) shown as part of the device

in Fig. 1), for displaying pictures comprising a plurality of picture elements (Col. 3, Ln. 16-25; Col. 9, Ln. 15-18), comprising:

- a plurality of pixels (2A) for displaying the picture elements (Abstract, Col. 3, Ln. 16-28, see Fig. 5), each pixel comprising:
  - a first electrode (13) and a second electrode (14) for receiving a potential difference (see Fig. 3 and Fig. 5; Col. 6, Ln. 49-55; Col. 8, Ln. 37-45); and
  - an electrophoretic medium (15) between the first electrode and the second electrode (Abstract, Col. 6, Ln. 66-67 to Col. 7, Ln. 1-11), which medium has a first and a second extreme optical state and an intermediate optical state intermediate between the first and the second extreme optical state (Col. 7, Ln. 18-32 and Ln. 57-65; Col. 8, Ln. 65 to Col. 9, Ln. 18; the intermediate optical state is disclosed "for example" as "the gray scale" between the first extreme optical state of "white" and the second extreme optical state of "black"; however, these states are used only as examples and do not limit the discussion with regard to other colors; the Inoue disclosure provides a description of a medium with extreme optical states and intermediate (or gray) states between those extremes); and
- drive means (66, 68 in Fig. 5) able to control, in operation, the potential difference, (Col. 2, Ln. 60-65; Col. 3, Ln. 16-28, Fig. 5) having a pulse duration (Col. 4, Ln. 63-65; here "value/time of the voltage" is equivalent to

pulse duration), for changing the optical state between the first extreme, the second extreme and the intermediate optical state, in dependence of the picture element to be displayed, characterized in that the drive means are able to control a singular equilibrium optical state as the intermediate optical state (Col. 4, Ln. 27-38; Col. 4, Ln. 63-65; Col. 8, Ln. 54 to Col. 9, Ln. 18; Col. 9, Ln. 31-57; Fig. 9; Inoue discloses that any number of intermediate (or gray) optical states can be produced and maintained as an equilibrium state using “pulse-surface-area modulation”; it is anticipated that one of these intermediate states will be the singular equilibrium optical state).

8. As pertaining to **Claim 2**, Inoue discloses an electrophoretic display panel (again, Inoue makes reference to an “electrophoretic display device”; however, the Inoue invention specifically describes the electrophoretic display panel (2) shown as part of the device in Fig. 1) characterized in that the drive means are able to control the potential difference (Abstract, Col. 2, Ln. 60-65; Col. 3, Ln. 16-28; Fig. 5):

- of equal sign and a relative short pulse duration for changing the optical state from the first optical state to the equilibrium optical state, as compared to the potential difference and the pulse duration for changing the optical state from the first to the second optical state (Col. 4, Ln. 58-65; Col. 8, Ln. 37-45; Col. 8, Ln. 65 to Col. 9, Ln. 18; Col. 9, Ln 31-43; Inoue discloses that the intermediate (or gray scale) is controlled by the

"value/time of the voltage to be applied", which anticipates a potential difference and relative short pulse duration for reaching the intermediate (or gray) state as compared to the potential difference and pulse duration for switching from one extreme optical state to the other extreme optical state), and

- of equal sign and a relative short pulse duration for changing the optical state from the second optical state to the equilibrium optical state, as compared to the potential difference and the pulse duration for changing the optical state from the second to the first optical state (Col. 4, Ln. 58-65; Col. 8, Ln. 37-45; Col. 8, Ln. 65 to Col. 9, Ln. 18; Col. 9, Ln 31-43; again, Inoue discloses that the intermediate (or gray scale) is controlled by the "value/time of the voltage to be applied", which anticipates a potential difference and relative short pulse duration for reaching the intermediate (or gray) state as compared to potential difference and pulse duration for switching from one extreme optical state to the other extreme optical state), and
- subsequently being substantially zero (Col. 7, Ln. 33-48; Inoue discloses the "retention property" in which the electrophoretic display maintains its optical state "for a long period of time even after the electric field is eliminated", i.e., when the potential difference is substantially zero).

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9. As pertaining to **Claim 3**, Inoue discloses an electrophoretic display panel characterized in that the equilibrium optical state is in the middle of the first and the second extreme optical state (Col. 7, Ln. 18-32 and Ln. 57-65; Col. 8, Ln-65 to Col. 9, Ln. 18; the intermediate (or gray) optical state is disclosed “for example” as “the gray scale” between the first extreme optical state of “white” and the second extreme optical state of “black”; the equilibrium optical state is anticipated as an intermediate (or gray) state in the middle of the first (“white”) and second (“black”) extreme optical states).

10. As pertaining to **Claim 4**, an electrophoretic display panel characterized in that the drive means are able to represent each picture element by at least two neighboring pixels (Col. 8, Ln. 65 to Col. 9, Ln. 18; Col. 8, Ln. 31-57; Fig. 9; Inoue discloses the pulse-surface-area modulation technique in which a pixel is divided into sub-pixels and the area of the sub-pixels is modified in order to represent picture or image elements by neighboring pixels; the Inoue discussion (Col. 9, Ln. 9-18) parallels the discussion provided in applicant’s specification in relation to representing a pixel by neighboring pixels.)

11. As pertaining to **Claim 5**, Inoue discloses an electrophoretic display panel characterized in that the at least two neighboring pixels each have a surface with an area for displaying the optical state, a first area of the areas being substantially 1/3 of a second area of the areas (Col. 8, Ln. 65 to Col. 9, Ln. 18; Col. 8, Ln. 31-57; Fig. 9; the discussion in Inoue and Fig. 9 teach a structure in which each pixel is divided into two

sub-pixels, "wherein the area of one is double the other"; this structure is given as an example, but does not limited the discussion to dividing a pixel into sub-pixels in which one "is double the other"; the claim recites the wording "substantially 1/3" in reference to the area ratio, which can broadly be interpreted as equal to 1/2), since "substantially" is a relative term.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claim 5** is also rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (US 6,842,165) in view of Katakura (US 5,317,437).

Inoue discloses an electrophoretic display panel characterized in that the at least two neighboring pixels each have a surface with an area for displaying the optical state (see Fig. 9; Col. 8, Ln. 65 to Col. 9, Ln. 18). However, the first area of the areas (91) is one half of the second area of the areas (92).

Inoue does not explicitly disclose a first area of the areas being substantially 1/3 of a second area of the areas.

Katakura discloses a liquid crystal display apparatus (601) (see Fig. 6) in which adjacent pixels (711, 712) are arranged with an area ratio of 3:1 (see Fig. 7; Col. 8, Ln. 33-38). Katakura shows adjacent pixels areas with a first area of the areas being substantially 1/3 of a second area of the areas (see Fig. 7) in order to realize various gray scales and to improve image quality (Col. 8, Ln. 40-50; Col. 8, Ln. 54-59). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the pixel area techniques taught by Katakura for a liquid crystal display with the pixel area techniques of Inoue for an electrophoretic display so as to apply a pixel ratio of 1/3 to neighboring pixels in order to improve the gray scale quality of the electrophoretic display.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

DiSanto et al (US 5,254,981) teaches an electrophoretic display which provides grey scale capability.

Matsuda et al (US 6,822,783) teaches an electrophoretic display with improved display capability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Mandeville whose telephone number is 571-270-3136. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason Mandeville  
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04/09/2007

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